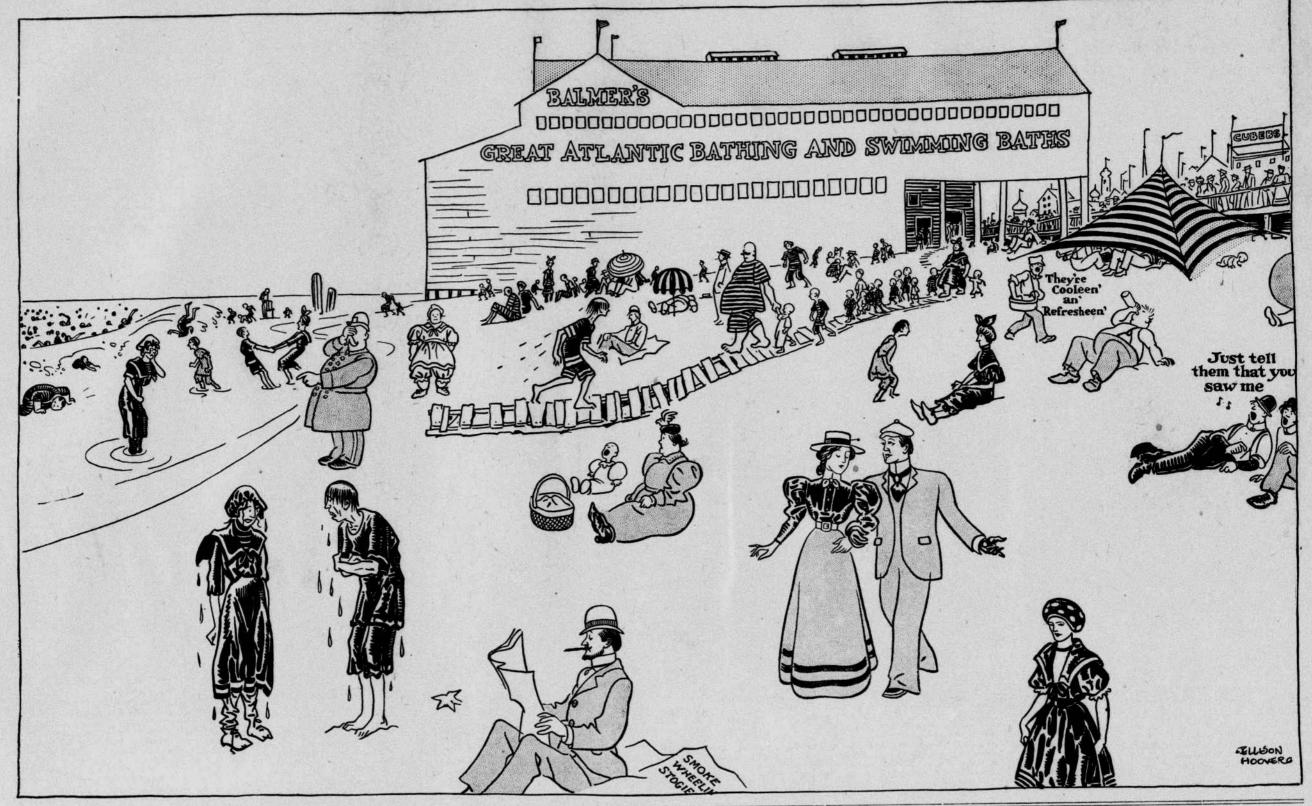
* WERE * THE * GOOD

Fond Beginnings of the Great American Bathing Suit



of Safety and Speeding of Trains Yields Demands

such that when it is multiplied by the number of tons saved the product would counteract the greater first cost of electric equip-

A first class steam locomotive costs about \$60,000, a first class electric locomotive about \$130,000. (Parenthetically it may be noted here that the cost of locomotive 999, the finest of its day, was \$13,000.)

The only railroad operating by electricity for long distances is the Chicago, Mil-440 miles east of Avery, Idaho, and another of 209 miles between Othello, Wash., and Seattle. Very low cost is made possible by cheap water power and by regenerative braking-that is, the locomotive, by friction while sliding down the mountains, generates electricity which is put back into the trolley and delivered to other locomotives climbing the mountains, about 20 per cent, of the current used being "regenerated" in this way.

Crude as were the first steam trains that startled our forefathers 100 years ago, it is interesting to note, while talking of speed, that a high rate of progress was attained quite early. The first railroad charter in England limited the gait to twelve miles an hour, and when thirty miles an hour was suggested it was said that "such a fearful velocity would without doubt have the most disastrous effects upon the circulation of the blood and vital

But in the '40s a British express made eighty miles an hour. In 1842, on the Great Western, there was a run between London and Slough of eighteen miles in fifteen minutes, and in 1848 a run between London and Didcot, fifty-three miles, in forty-seven minutes. That was the period of the "battle of the gauges," when the advocates of the broad and of the narrow gauges were trying to down each other.

In the '90s the achievement of the Empire State Express caused the British people to demand that their roads give an account of themselves. The result was a British train, out to do or die, with the bit in its teeth, averaging 63.3 miles an hour, including stops, from London to Aberdeen. This took the record from the Empire State Express, but the New York Central came back on September 11, 1895, with a racing crain which slogged the 438 miles between New York and Buffalo in 6 hours and 51 minutes. This was at the rate of 64.22 miles an hour including stops, and once more America was ahead.

Engine 999 was designed by the late

as was his genius, it would have been of little avail if it were not for improvement of the track made possible by Dr. Plimpton H. Dudley, then and now consulting engineer of rails, tire and structural steel.

So much for the railroads. How about steamships? Are they moving any faster than formerly? Warships are, for speed is half their battle, and they need not count the cost; but not merchantmen. The Cunarder Mauretania crossed the Atlantic, from Daunt's Rock, off Queenstown, to the Ambrose Channel Lightship, between September 11 and 15, 1910, in 4 days, 10 hours and 41 minutes. She has never done as well since, and no other ship has done as well. The feat of the Mauretania, nearly eleven years ago, is the record for the

tive power of the New York Central. Fine highest. On a run in January, 1911, she made 676 knots in a day, an hourly aver-

age of 27.04. "The average man," said W. F. Gibbs chief of construction of the International Mercantile Marine, to the writer, "does not appreciate what a task it is to increase ocean speed by a single knot."

Progress has indeed been slow. The speed precocity of the steam locomotive on land was not duplicated in the case of the steamship. Going back to 1840, we find the Britannia crossing from Liverpool to Boston in 14 days, at an average speed of 81/2 knots. Eighteen years later the Great Eastern, between Liverpool and New York, averaged 14.6 knots.

"But the Great Eastern was a ship ahead pull up from a speed of 8½ to 20 knots.

William Buchanan, superintendent of mo- Atlantic, and her knot speed is also the of her time," remarked Mr. Gibbs. "Not she had many features which have been

repeated in modern liners." Another fast ship, the Scotia, came from Liverpool to New York in 1866 in 8 days, 2 hours and 48 minutes. Fourteen years later, in 1881, the City of Rome set a new 17 knot average for the passage from Liverpool to New York. The ambition of designers then was to build a steamship was the City of forerunner of the express steamships as we tively small high speed steamships. and 24 minutes. Her average was 20.7 knots. It had taken forty-nine years to

until 1900 was she surpassed in size, and in 1890, were faster by a fraction of a knot. In 1894 along came the Lucania, a 22 knot boat, bridging New York and Queenstown with the speediest thing affoat, the Deutschland, startling the marine world by passing from New York to Plymouth in 5 days 7 hours 38 minutes, an average of 23.51 Olympic, the Titanic, sunk on her first voyknots. Thus the gauntlet was thrown becapable of sustained speed at 20 knots. fore the North German Lloyd, which re- the Berengaria of the Cunard Line; the The first to make over 20 knots on a trans- torted by launching the Kaiser Wilhelm II. Vaderland, now the Leviathan, and the Paris. In in 1903 and the Kronprinzessin Cecilie in Bismarck, to be known as the Majestic. 1889 this first twin screw Atlantic liner, 1907. These marked the last of the rela-The know them now, crossed in 5 days 14 hours Kaiser Wilhelm II. made a record from Plymouth to New York of 5 days 8 hours 16 minutes, an average of 23.58 knots.

"The next advance," said Mr. Gibbs, "was

The Teutonic and Majestic, commissioned accompanied by great increase marked the advent of the giant type of steamship, the Mauretania and the Lusitania. They quickly took both the eastin 5 days 7 hours 23 minutes. Then, in ward and westward Atlantic records. At 1900, arose the Hamburg-American Line, first the Lusitania had a shade the better of the two, but the Mauretania forged ahead of her and now holds both records." A race of real giants came next-the

age; the Aquitania, the Imperator, now They ranged in size from 46,000 to 56,000 gross tons, against the 30,000 tons of the Mauretania, and their horse power ranged from 60,000 to 80,000. They aimed at sustained speed of about 23 knots, not at record breaking. As was the case with the railroads, the higher speed did not pay. The other day the newest liner-the Paris of the French line-reached New York. Fast, yes, about 22 knots; but purposely not a world beater.

"Is it possible to build faster ships than the Mauretania?" Mr. Gibbs was asked. He

"Yes, it is perfectly possible to-day to have a ship that will maintain a speed of 30 knots across the Atlantic, so that a man may leave London on Wednesday and reach New York on Sunday. That is, it is mechanically possible; but cost is another matter. Cost of construction and operation increases enormously in relation to speed. The Mauretania now pegs along at 22 or 23 knots. She could go faster, just as she used to do, but it is more economi-

cal to keep her at the reduced speed." While we were at war Mr. Gibbs designed for the Shipping Board a new type of steamship, 1,000 feet long-that length, greater than anything now afloat, being fixed by the limitations of the locks of the Panama Canal. The war ended before any construction was started, and the design is a Government secret, so that the architect cannot talk about it. But he believes that such a ship could do better than 30 knots and be operated at a profit.

Meanwhile the fastest ships in the world are the torpedo boat destroyers. They are capable of doing better than 39 knots. Ours are. anyway.

Typical of one of our fast destroyers is the Reid, which made 43 land miles an hour on her trial trip, though she was built in record time. The fastest that man ever travelled was in France last spring, when Bernard de Romanet, flying a Spad machine, went over a measured mile at the rate of 193 miles an hour-and survived.

Bane of Man, Is Little Understood Humidity, the about six inches apart and connected at the

Real Cause of Sweltering Days Even Is Meas-

By E. B. "FARMER" DUNN.

Author of "The Weather and How to

Forecast It."

F there is anything that causes a man to feel that he is justified in getting rid of an overload of un-Christianiike thought, it is to be compelled to swelter, coze and drip under high humidity. Mother nature has been working overtime lately and those of us not possessed of a large vocabulary of cuss words have been deprived of such apparent relief and have taken our humid bath philosophically.

Humidity, one of the important elements of our atmosphere, has never been fully understood, not alone by the layman but by the meteorologist and scientist. We know that there is more or less invisible aqueous vapor in the atmosphere at all times. We also know that evaporation goes on at all times and under all conditions; otherwise, at some periods there would not be enough moisture in the air to sustain vegetable and animal life. We also know that there is a relationship between moisture in sus-pension and the temperature and that they are relative. That is the reason for the term relative humidity.

Humidity, therefore, in its relative sense is governed by temperature. The atmosphere is like a sponge and has capacity for 100 per cent. of moisture, or complete saturation. When that point is reached we are not surthat the atmosphere is capable of holding,

ured Inaccurately by Weather Sharps densed and precipitated in one form or

It not infrequently happens that the humidity stands at 95 per cent, and no rain snow falls. That is the time of physical suffering; particularly in the summer, when the temperature is also high.

It often happens that rain or snow falls when there is 60 or 70 per cent. of humidity, shows that it is not necessary for the humidity to invariably reach 100 per cent. before precipitation occurs. Humidity naturally causes more physical

liscomfort in summer than in winter, because the capacity of the atmosphere for g moisture is greater in the warmer months. It is then that moisture is evaporated more rapidly and held in suspension longer due to the increasing heat of the day, but unless the evaporation keeps pace with the increasing heat there will be a propor-tionate decrease of humidity. For instance, if there is a temperature of 70 degrees and a temperature rises as the day advances, the humidity will show a corresponding fall; cept there are times when both increase. is on such occasions, when the sun has gone down and radiation of heat from the earth has practically ceased and the temperature begins to fall, decreasing the atmo capacity for absorption to a point where it cannot hold all the moisture it had absorbed inder the higher temperature, that thunderstorms take place.

moisture in suspension is immediately con- ture, the temperature having fallen, there

close to 100 per cent. Under such circumstances there would be no relief, unless the temperature fell faster than the evaporation takes place; which is generally the case after a thunderstorm and after sunset.

At night the atmosphere naturally contracts through radiation of heat, and if the amount of moisture remains equally as high as during the day local thunderstorms

The air is generally dryest about t and most moist about midnight, though the amount of vapor present is the same.

Humanity suffers more from moist heat than from dry heat; the reason being that when the atmosphere is moist bodily per-spiration is not readily evaporated and one feels sticky and very uncomfortable, if not considerably enervated, but when the tem-perature is high and the atmosphere dry one mediately feels relief from cooling by

During periods of high humidity the becomes a storehouse for elecleaves us: with the loss of that power on become weakened and exhausted. With the return of a dry atmosphere our bodies

become more endurable.

The present method of measuring humidity is very crude and not at all satisfactory, and its utility has been a question for many years. It is not accurate for many reasons

The practice is to fasten two thermometers

top by a crossbar, to which is fastened a worm gear and connected thereto a handle by which to whirl the instruments. The bulb of one thermometer is covered with a piece of linen. The other is left uncovered. When an "observation" is taken the line is thoroughly saturated; the other bulb left free and dry. The instruments are whirled at each "observation" at as nearly a uniform rate of speed as is possible by hand. Any variation in the rate of speed at which the instruments are revolved increases or de-creases the rate of evaporation and causes the range of readings of the thermometers to be proportionately relatively greater less. Then after the necessary mathematical calculation which is to complete the work the percentage of humidity is arrived

t, which is only approximately correct.

If the method of obtaining knowledge of this important element of our atmosphere defective at one point it is reasonable to believe that it is wrong at all points, and it is a mere guess at the relative proportions of heat and moisture

Although humidity is equally as important as the temperature, the latter has a standard of measurement; humidity has not.

Humidity has an elastic range-a healthful percentage along the Atlantic or Pacific coasts would be from 50 to 75 per cent. beneficial to plant life but enervating to animal life. A continuous percentage be tween 20 and 40 would be too dry for vegetable but comparatively healthy for animal

In the Central States the range is from 20 to 75 per cent.; in the Southwest, Texas, New Mexico and Arizona from 15 to 45 per Humidity diminishes with the distant cent. from the coast. The Rocky Mountain States are comparatively dry on the eastern slopes.